PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

To:

SCHÄFERJOHANN, Volker
Deutsche Thomson-Brandt GmbH
European Patent Operations
Karl-Wiechert-Allee 74
30625 Hannover
ALLEMAGNE

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

Date of mailing (day/month/year)
06 août 2001 (06.08.01)

Applicant's or agent's file reference
PD990068

IMPORTANT NOTIFICATION

International application No.
PCT/EP00/09311

International filing date (day/month/year)
23 septembre 2000 (23.09.00)

1. The following indications appeared on record concerning:

[X] the applicant [ ] the inventor [ ] the agent [ ] the common representative

Name and Address
DEUTSCHE THOMSON-BRANDT GMBH
Hermann-Schwer-Str. 3
78048 Villingen-Schwenningen
Germany

State of Nationality: DE
State of Residence: DE
Telephone No.: +49 511 418 0
Facsimile No.: +49 511 418 2811
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[X] the person [X] the name [X] the address [X] the nationality [X] the residence

Name and Address
THOMSON LICENSING S.A.
46, quai A. Le Gallo
F-92100 Boulogne-Billancourt
France

State of Nationality: FR
State of Residence: FR
Telephone No.: 33 1 41 86 52 73
Facsimile No.: 33 1 41 86 56 34
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[X] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Beate Giffo-Schmitt
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 07 June 2001 (07.06.01)	
International application No. PCT/EP00/09311	**Applicant's or agent's file reference** PD990068
International filing date (day/month/year) 23 September 2000 (23.09.00)	**Priority date** (day/month/year) 27 September 1999 (27.09.99)
Applicant WEITBRUCH, Sébastien et al	

1. The designated Office is hereby notified of its election made:

   [X] in the demand filed with the International Preliminary Examining Authority on:

   19 April 2001 (19.04.01)

   [ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

   [ ] was not

   made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer J. Leitao
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
PD990068		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/EP 00/ 09311	23/09/2000	27/09/1999
Applicant		
DEUTSCHE THOMSON-BRANDT GMBH		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 12

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT 00/09311

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G09G G06T

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 893 916 A (MATSUSHITA) 27 January 1999 (1999-01-27) abstract column 4, line 49 -column 5, line 33 column 12, line 3 -column 16, line 22	1,4,7
A	column 20, line 56 -column 21, line 21	2-7
A	US 5 109 425 A (LAWTON) 28 April 1992 (1992-04-28) abstract column 3, line 50 -column 4, line 4 column 5, line 10 - line 51 column 10, line 34 -column 11, line 38 column 12, line 14 - line 63; figure 6	1

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 January 2001	24/01/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	O'Reilly, D

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/[redacted]00/09311

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	ZHU Y -W ET AL: "15.3: A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE FOR REDUCTING GRAY-SCALE DISTURBANCES ON PDPS" SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS,US,SANTA ANA, SID, vol. 28, 13 May 1997 (1997-05-13), pages 221-224, XP000722692 ISSN: 0097-966X cited in the application page 222, right-hand column, line 6 -page 223, left-hand column, line 16; figures 4,5; table 2 -----	1-7

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/00/09311

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 893916 A	27-01-1999	JP 11231827 A	27-08-1999
		JP 11212517 A	06-08-1999
US 5109425 A	28-04-1992	NONE	

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number
WO 01/24151 A1

(51) International Patent Classification[7]: G09G 3/28

(21) International Application Number: PCT/EP00/09311

(22) International Filing Date:
23 September 2000 (23.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
99118990.3 27 September 1999 (27.09.1999) EP

(71) Applicant *(for all designated States except US)*: **DEUTSCHE THOMSON-BRANDT GMBH** [DE/DE]; Hermann-Schwer-Str. 3, 78048 Villingen-Schwenningen (DE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WEITBRUCH, Sébastien** [FR/DE]; Chabeuilstr. 7, 78087 Mönchweiler (DE). **ZWING, Rainer** [DE/DE]; Bozener Str. 2, 78052 Villingen-Schwenningen (DE).

(74) Agent: SCHÄFERJOHANN, Volker; Deutsche Thomson-Brandt GmbH, European Patent Operations, Karl-Wiechert-Allee 74, 30625 Hannover (DE).

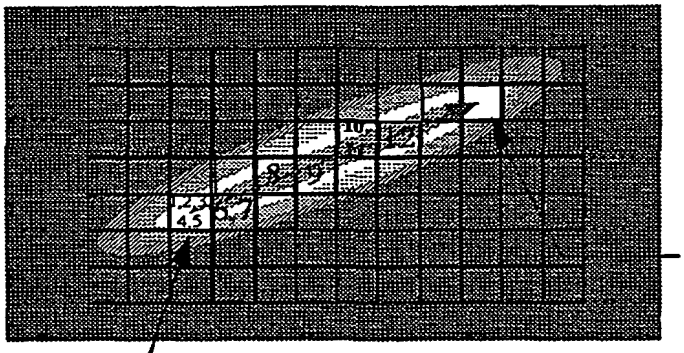
(81) Designated States *(national)*: AE, AG, AL, AU, BA, BB, BG, BR, CA, CN, CR, CU, CZ, DM, DZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LV, MA, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, YU, ZA.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*
— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

[Continued on next page]

(54) Title: METHOD FOR PROCESSING VIDEO PICTURES FOR DISPLAY ON A DISPLAY DEVICE



(57) Abstract: With the new plasma display panel technology new kinds of artefacts can occur in video pictures. These artefacts are commonly described as "dynamic false contour effect", since they correspond to disturbances of gray levels and colors in the form of an apparition of colored edges in the picture when the observation point on the PDP screen moves. Often, such an artefact is compensated by analyzing the motion in the pictures, assigning to a pixel a corresponding motion vector (MV) and performing a re-coding step in which the different sub-fields code word entries of a pixel are shifted to distribute the sub-fields of a pixel more closely on the eye trajectory. It is disclosed a procedure for transforming the motion vectors into a more symmetrical form before applying the compensation in order to better respect the symmetry of the human visual system. It has prooved to be advantageous to better make an under-compensation by rounding down the motion vector components irrespective of their rational component value before symmetrization. A further aspect of the invention is a specific rounding process used for calculating the correction pixel locations when making a correction on signal amplitude level instead of sub-field level.

WO 01/24151 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Int[redacted] Application No
PCT/[redacted]00/09311

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G09G G06T

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 893 916 A (MATSUSHITA) 27 January 1999 (1999-01-27) abstract column 4, line 49 -column 5, line 33 column 12, line 3 -column 16, line 22	1,4,7
A	column 20, line 56 -column 21, line 21	2-7
A	US 5 109 425 A (LAWTON) 28 April 1992 (1992-04-28) abstract column 3, line 50 -column 4, line 4 column 5, line 10 - line 51 column 10, line 34 -column 11, line 38 column 12, line 14 - line 63; figure 6	1

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 January 2001	24/01/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	O'Reilly, D

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int[redacted] Application No
PCT/[redacted]00/09311

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ZHU Y -W ET AL: "15.3: A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE FOR REDUCTING GRAY-SCALE DISTURBANCES ON PDPS" SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS,US,SANTA ANA, SID, vol. 28, 13 May 1997 (1997-05-13), pages 221-224, XP000722692 ISSN: 0097-966X cited in the application page 222, right-hand column, line 6 -page 223, left-hand column, line 16; figures 4,5; table 2	1-7

1

INTERNATIONAL SEARCH REPORT

Information [redacted] patent family members

Intr[redacted] Application No
PCT/[redacted]00/09311

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 893916 A	27-01-1999	JP 11231827 A	27-08-1999
		JP 11212517 A	06-08-1999
US 5109425 A	28-04-1992	NONE	

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

12

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PD990068		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/09311	23/09/2000	27/09/1999
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON LICENSING S.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 11 (12) sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
- VI ☒ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
19/04/2001	28.12.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Morris, D Telephone No. +49 89 2399 2182

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09311

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-20 as originally filed

Claims, No.:

1-7 as originally filed

Drawings, sheets:

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☒ the claims, Nos.: 1-7

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	6
	No:	Claims	1, 3-5, 7
Inventive step (IS)	Yes:	Claims	6
	No:	Claims	2
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item VIII

Certain observations on the international application

1.1 Reference is made to the following documents:

D1: EP-A-0 893 916 (MATSUSHITA) 27 January 1999 (1999-01-27)

D2: ZHU Y -W ET AL: '15.3: A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE FOR REDUCTING GRAY-SCALE DISTURBANCES ON PDPS' SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS,US,SANTA ANA, SID, vol. 28, 13 May 1997 (1997-05-13), pages 221-224, XP000722692 ISSN: 0097-966X cited in the application

D3: EP 0980059 A (DEUTSCHE THOMSON-BRANDT GMBH) 16 Febuary 2000 (16.02.2000)

1.1a The document D3, though cited by the Applicant self, was not cited in the international search report.

2. The following objections are made within the meaning of Article 6 PCT with respect clarity.

2.1 The feature of a "discrete motion vector" of present independent claim 1 is considered obscure as it is not clear from the wording of the claim alone (- PCT Guidelines III-4.2) in what respect said motion vector is restricted. It is noted in this respect that "vectors" per se are generally defined as comprising both direction and magnitude, whereupon it becomes obscure whether the restriction applied to the "discrete motion vector" of independent claim 1 is one involving options of:

- direction;
- magnitude; or
- both direction and magnitude.

Furthermore, it is noted from what is mentioned in the description (- see page 13, lines 20-21) that "discrete motion vectors" appear restricted merely in respect of "direction" only. However, from what is mentioned on lines 13-16 of present claim 1, i.e. of:

> "performing correction of video values [...] along the direction of motion determined for the pixels along the direction of motion determined by the motion vector"

it is implied by the wording of present claim 1 that a said "discrete motion vector" is only to be restricted in respect of its magnitude, whereupon there arises an inconsistency between the description and the claims (- Article 6 PCT; Guidelines III-4.3).

2.2 In a related aspect, the feature of a motion vector (so far as understood) having "a more symmetrical arrangement" of present independent claim 1 (- line 19) is also considered obscure as, assuming that e.g. vertical and horizontal components of a vector may be considered to have a symmetry of sorts, it is not clear in what respect one set of motion vectors may be considered to have a more symmetrical, or asymmetrical, arrangement than any other set of motion vectors. As such therefore the term objected to appears to comprise a form of wording considered to be vague or equivocal, and which leaves the reader in doubt as to the exact scope of the feature (- PCT Guidelines III-4.5).

2.2a In addition, when taking into account wording of the description of the present disclosure (- see e.g. "the compensation [...] respects more the symmetry of the human visual system" - page 16, lines 28-29 of the present application), it also becomes obscure as to whether or not the term "symmetry" per se has a special meaning in the sense of PCT Guidelines III-4.2), i.e. said special meaning involving "symmetry of the human visual system" rather than e.g. the vertical and horizontal components of a vector.

2.3 The feature of the "optimised correction trajectory" of independent claim 1 is considered obscure as the functional relationship between said "trajectory" and the respective features of (- cf. e.g. "Subfield No" tables on pages 15-17):

- the "discrete motion vector" (so far as understood); and
- the "sub-field code words",

is not clearly defined within the claim.

Furthermore said functional relationship, in respect of determining pixel positions to which correction values within video data for pixels are to be placed, also appears essential to the performance of the invention. As such therefore, failure to explicitly define said feature, is considered to cause an inconsistency between claim 1 and description (- Article 6 PCT; Guidelines III-4.3).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3.1 D2 discloses a method for processing video pictures (- "A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE" - TITLE) for display on a display device (- Plasma Display Panel - Page 221, left column, second paragraph, line 1) having a plurality of luminous elements corresponding to the pixels of a picture, wherein

- the time duration of a video frame or video field is divided into a plurality of sub-fields (- Modified Binary Code Scheme - Fig. 1b) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, and wherein
- motion vectors are calculated for pixels (- "Vector of Motion" - Fig. 5, comprising vertical component GHI and horizontal component IQRSTUVW), said motion vectors being used to determine corrected sub-field code words (- apply equalizing pulses - Table I and II and Fig. 4) for dynamic false contour effect compensation (- to compensate for "loss of temporal uniformity" due to change from 127th grey level to 128th grey level - page 222, left column, last three lines of the first paragraph).

3.1a Furthermore, insofar as D2 discloses applying motion correction in one of either:

- a vertical direction; or
- a horizontal direction

i.e. of the components GHI and IQRSTUVW of the "vector of motion" (- Fig. 5), the lesser of the two, is used in determining the corrected value (- page 223, left column, middle paragraph), D2 is also considered to disclose:

- "the motion vector field is restricted to discrete motion vectors [which] have a more symmetrical arrangement",

(- i.e. the vertical and horizontal directions equally dividing up the vector space).

3.1b In addition, insofar as the direction and magnitude of the discrete motion vector selected according to the teaching of D2 is optimised to include all pixels GHI and

QRSTUVW representing componenct vectors of the "vector of motion" in the "boundary of 127/128" (- Fig. 5 of D2), D2 is also considered to disclose:

"the exchanged motion vector serves for calculating an optimised correction trajectory that determined at which pixel positions along the [discrete] motion vector the correction values are placed for dynamic false contour compensation"

Accordingly, so far as understood, the subject matter of present independent claim 1 is not considered novel over D2 within the meaning of Article 33(2) PCT.

3.2 Further, insofar as D2 also discloses using said method in a plasma display panel (- Plasma Display Panel - Page 221, left column, second paragraph, line 1), the subject matter of independent claim 7 is also considered to lack novelty within the meaning of Article 33(2) PCT.

3.3 Further, insofar as D2 discloses (- cf. dependent claim 5):

- the correction values are distributed among a number of pixels (- Pixel positions J, K - Fig. 4) which are located among a motion vector determined for a pixel of the picture,

the subject matter of dependent claim 5, so far as understood, is also not considered novel over D2 within the meaning of Article 33(2) PCT.

3.4 Furthermore, insofar as mentioned in D2 that the display of any digital signal on a display apparatus comprising discrete pixel elements involves a rounding down process (- cf. dependent claims 2-4), i.e. see

"When an image is moving at 3.5 [P/F], for instance, the speed of the image on the screen repeats v=3 and 4 [P/F]" (- page 223, right column, second last paragraph, lines 3-6),

and insofar as that it is implicit that this rounding process would apply equally to both vector components of a motion vector, i.e. whether said components comprise either the vertical or horizontal component of the motion vector, the subject matter of dependent claims 3-4 are also not considered novel over D2 within the meaning of Article 33(2) PCT

3.5 It is acknowledged that D2 fails to disclose the steps of converting that component of the motion vector which is of largest value, as mentioned in dependent claim 2.

However, insofar as D2 discloses only ever using that component of the motion vector which has the smallest value (- "choose the direction with the lesser number" - page 223, left column, middle paragraph, line 6), said step of rounding down is not considered to provide any effect over that, which would have been expected by the person skilled in the art, were said step not to have taken place.

Accordingly, so far as understood, the respective subject matters of dependent claim 2 is not considered to involve an inventive step over D2 within the meaning of Article 33(3) PCT.

3.6 The subject matter of claim 6 is distinguished from D2 in that D2 fails to disclose or suggest the steps therein of calculating pixel positions which are used for correction value distribution.

3.6a In addition, none of the other available prior art documents, either alone or in combination, suggest or imply subject matter claimed in respect of dependent claim 6.

Accordingly, the subject matter of dependent claim 6 is considered to comprise new and inventive subject matter. Furthermore, dependent claim 6 is considered to meet the requirements of Articles 33(2)(3) PCT

Re Item VI

Certain documents cited (Rule 70.10 PCT)

4.1 D3 was published after the priority date of the present application, but the priority date of D3, i.e. 07 August 1998, is eleven months earlier than that of the present application (- see also Rules 64.3 and 70.10 PCT). Furthermore it is noted that insofar as e.g. D3 discloses a method for processing video pictures for a display device having a plurality of luminous elements, said method involving (- cf. preamble of claim 1 and features of dependent claim 6):

sub-fields (- Fig. 5);

pixel positions (- [SPEC0808]x_n, [SPEC0808]y_n - table of Page 5, paragraph 28); and

motion vectors (- "motion vector V = (Vx, Vy)" - page 5, line 26)

both the present application and the disclosure of D3 appear to be directed to substantially the same subject matter.

The Applicant is therefore subsequently reminded that though D3 cannot be considered as prior art within the meaning of Articles 33(2)(3) PCT for the purposes of an International Preliminary Examination Report, when the present application enters the national phase under Article 39(1) PCT, the subject matter of D3, in at least some Contracting States, may nevertheless be considered prior art. For example, under the European Patent Convention, the subject matter of D3 would be considered prior art within the meaning of Article 54(3) EPC, which merely prevents D3 from being used in the assessment of inventive step.

4.2 The Applicant is further reminded in this respect that the characterisation portion of independent claim 1 (- Rule 6.3(ii) PCT), in respect of the usefulness of the conversion of the motion vectors to "a more symmetrical form" (- so far as understood, i.e. through the rounding method of dependent claim 2) for dynamic false contour effect compensation, does not appear to be supported by the description.

Re Item VII

Certain defects in the international application

6.1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, i.e. it being noted that D1, in common with the subject matter of independent claim 1, discloses a method of processing video pictures (- Fig. 24), said method involving:

a display device (- "using the PDPs" - column 4, line 26) having a plurality of luminous elements;

video fields divided into a plurality of subfields (- Figs. 3a-6b and 9); and

using motion vectors (- "motion vector MV" - Fig. 25 and column 21, lines 12-15 and 41-46) to determine corrected subfield code words for dynamic false contour effect compensation (- "can reduce occurrence of moving image false edges" - column 4, lines 38-40),

and as such appears to disclose the closest prior art (- Article 33(2) PCT).

6.2 The description should be in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

PATENT COOPERATION TREATY

EXPRESS EV025962849US

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SCHÄFERJOHANN, Volker
DEUTSCHE THOMSON-BRANDT GMBH
European Patent Operations
Karl-Wiechert-Allee 74
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ALLEMAGNE

THOMSON multimedia
RECEIVED
21. Feb. 2002
Patent Department
Administration-Hannover

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	20.02.2002
Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
PD990068 ✓	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/09311 ✓	23/09/2000	27/09/1999

Applicant
THOMSON LICENSING S.A.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

* Please find enclosed a corrected version of the IPER dated 28.12.01.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	De Caevel, J-M Tel.+49 89 2399-2251

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PD990068		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/09311	23/09/2000	27/09/1999
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON LICENSING S.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 12 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☒ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
19/04/2001	20.02.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Morris, D Telephone No. +49 89 2399 2182

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09311

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-20	as originally filed				

Claims, No.:

1-7	as received on	24/10/2001	with letter of	24/10/2001	

Drawings, sheets:

1/7-7/7	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☒ the claims, Nos.: 1-7

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2, 6
	No:	Claims	1, 3-5, 7
Inventive step (IS)	Yes:	Claims	6
	No:	Claims	2
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item VIII

Certain observations on the international application

1.1 Reference is made to the following documents:

D1: EP-A-0 893 916 (MATSUSHITA) 27 January 1999 (1999-01-27)

D2: ZHU Y -W ET AL: '15.3: A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE FOR REDUCTING GRAY-SCALE DISTURBANCES ON PDPS' SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS,US,SANTA ANA, SID, vol. 28, 13 May 1997 (1997-05-13), pages 221-224, XP000722692 ISSN: 0097-966X cited in the application

D3: EP 0980059 A (DEUTSCHE THOMSON-BRANDT GMBH) 16 Febuary 2000 (16.02.2000)

1.1a The document D3, though cited by the Applicant self, was not cited in the international search report.

2. The following objections are made within the meaning of Article 6 PCT with respect clarity.

2.1 The feature of a "discrete motion vector" of present independent claim 1 is considered obscure as it is not clear from the wording of the claim alone (- PCT Guidelines III-4.2) in what respect said motion vector is restricted. It is noted in this respect that "vectors" per se are generally defined as comprising both direction and magnitude, whereupon it becomes obscure whether the restriction applied to the "discrete motion vector" of independent claim 1 is one involving options of:

- direction;
- magnitude; or
- both direction and magnitude.

Furthermore, it is noted from what is mentioned in the description (- see page 13, lines 20-21) that "discrete motion vectors" appear restricted merely in respect of "direction" only. However, from what is mentioned on lines 13-16 of present claim 1, i.e. of:

> "performing correction of video values [...] along the direction of motion determined for the pixels along the direction of motion determined by the motion vector"

it is implied by the wording of present claim 1 that a said "discrete motion vector" is only to be restricted in respect of its magnitude, whereupon there arises an inconsistency between the description and the claims (- Article 6 PCT; Guidelines III-4.3).

2.2 In a related aspect, the feature of a motion vector (so far as understood) having "a more symmetrical arrangement" of present independent claim 1 (- line 19) is also considered obscure as, assuming that e.g. vertical and horizontal components of a vector may be considered to have a symmetry of sorts, it is not clear in what respect one set of motion vectors may be considered to have a more symmetrical, or asymmetrical, arrangement than any other set of motion vectors. As such therefore the term objected to appears to comprise a form of wording considered to be vague or equivocal, and which leaves the reader in doubt as to the exact scope of the feature (- PCT Guidelines III-4.5).

2.2a In addition, when taking into account wording of the description of the present disclosure (- see e.g. "the compensation [...] respects more the symmetry of the human visual system" - page 16, lines 28-29 of the present application), it also becomes obscure as to whether or not the term "symmetry" per se has a special meaning in the sense of PCT Guidelines III-4.2), i.e. said special meaning involving "symmetry of the human visual system" rather than e.g. the vertical and horizontal components of a vector.

2.3 The feature of the "optimised correction trajectory" of independent claim 1 is considered obscure as the functional relationship between said "trajectory" and the respective features of (- cf. e.g. "Subfield No" tables on pages 15-17):

- the "discrete motion vector" (so far as understood); and
- the "sub-field code words",

is not clearly defined within the claim.

Furthermore said functional relationship, in respect of determining pixel positions to which correction values within video data for pixels are to be placed, also appears essential to the performance of the invention. As such therefore, failure to explicitly define said feature, is considered to cause an inconsistency between claim 1 and description (- Article 6 PCT; Guidelines III-4.3).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3.1 D2 discloses a method for processing video pictures (- "A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE" - TITLE) for display on a display device (- Plasma Display Panel - Page 221, left column, second paragraph, line 1) having a plurality of luminous elements corresponding to the pixels of a picture, wherein

- the time duration of a video frame or video field is divided into a plurality of sub-fields (- Modified Binary Code Scheme - Fig. 1b) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, and wherein
- motion vectors are calculated for pixels (- "Vector of Motion" - Fig. 5, comprising vertical component GHI and horizontal component IQRSTUVW), said motion vectors being used to determine corrected sub-field code words (- apply equalizing pulses - Table I and II and Fig. 4) for dynamic false contour effect compensation (- to compensate for "loss of temporal uniformity" due to change from 127th grey level to 128th grey level - page 222, left column, last three lines of the first paragraph).

3.1a Furthermore, insofar as D2 discloses applying motion correction in one of either:

- a vertical direction; or
- a horizontal direction

i.e. of the components GHI and IQRSTUVW of the "vector of motion" (- Fig. 5), the lesser of the two, is used in determining the corrected value (- page 223, left column, middle paragraph), D2 is also considered to disclose:

- "the motion vector field is restricted to discrete motion vectors [which] have a more symmetrical arrangement",

(- i.e. the vertical and horizontal directions equally dividing up the vector space).

3.1b In addition, insofar as the direction and magnitude of the discrete motion vector selected according to the teaching of D2 is optimised to include all pixels GHI and

QRSTUVW representing componenct vectors of the "vector of motion" in the "boundary of 127/128" (- Fig. 5 of D2), D2 is also considered to disclose:

"the exchanged motion vector serves for calculating an optimised correction trajectory that determined at which pixel positions along the [discrete] motion vector the correction values are placed for dynamic false contour compensation"

Accordingly, so far as understood, the subject matter of present independent claim 1 is not considered novel over D2 within the meaning of Article 33(2) PCT.

3.2 Further, insofar as D2 also discloses using said method in a plasma display panel (- Plasma Display Panel - Page 221, left column, second paragraph, line 1), the subject matter of independent claim 7 is also considered to lack novelty within the meaning of Article 33(2) PCT.

3.3 Further, insofar as D2 discloses (- cf. dependent claim 5):

- the correction values are distributed among a number of pixels (- Pixel positions J, K - Fig. 4) which are located among a motion vector determined for a pixel of the picture,

the subject matter of dependent claim 5, so far as understood, is also not considered novel over D2 within the meaning of Article 33(2) PCT.

3.4 Furthermore, insofar as mentioned in D2 that the display of any digital signal on a display apparatus comprising discrete pixel elements involves a rounding down process (- cf. dependent claims 2-4), i.e. see

"When an image is moving at 3.5 [P/F], for instance, the speed of the image on the screen repeats v=3 and 4 [P/F]" (- page 223, right column, second last paragraph, lines 3-6),

and insofar as that it is implicit that this rounding process would apply equally to both vector components of a motion vector, i.e. whether said components comprise either the vertical or horizontal component of the motion vector, the subject matter of dependent claims 3-4 are also not considered novel over D2 within the meaning of Article 33(2) PCT

3.5 It is acknowledged that D2 fails to disclose the steps of converting that component of the motion vector which is of largest value, as mentioned in dependent claim 2.

However, insofar as D2 discloses only ever using that component of the motion vector which has the smallest value (- "choose the direction with the lesser number" - page 223, left column, middle paragraph, line 6), said step of rounding down is not considered to provide any effect over that, which would have been expected by the person skilled in the art, were said step not to have taken place.

Accordingly, so far as understood, the respective subject matters of dependent claim 2 is not considered to involve an inventive step over D2 within the meaning of Article 33(3) PCT.

3.6 The subject matter of claim 6 is distinguished from D2 in that D2 fails to disclose or suggest the steps therein of calculating pixel positions which are used for correction value distribution.

3.6a In addition, none of the other available prior art documents, either alone or in combination, suggest or imply subject matter claimed in respect of dependent claim 6.

Accordingly, the subject matter of dependent claim 6 is considered to comprise new and inventive subject matter. Furthermore, dependent claim 6 is considered to meet the requirements of Articles 33(2)(3) PCT

Re Item VI

Certain documents cited (Rule 70.10 PCT)

4.1 D3 was published after the priority date of the present application, but the priority date of D3, i.e. 07 August 1998, is eleven months earlier than that of the present application (- see also Rules 64.3 and 70.10 PCT). Furthermore it is noted that insofar as e.g. D3 discloses a method for processing video pictures for a display device having a plurality of luminous elements, said method involving (- cf. preamble of claim 1 and features of dependent claim 6):

sub-fields (- Fig. 5);

pixel positions (- [SPEC0808]x_n, [SPEC0808]y_n - table of Page 5, paragraph 28); and

motion vectors (- "motion vector V = (Vx, Vy)" - page 5, line 26)

both the present application and the disclosure of D3 appear to be directed to substantially the same subject matter.

The Applicant is therefore subsequently reminded that though D3 cannot be considered as prior art within the meaning of Articles 33(2)(3) PCT for the purposes of an International Preliminary Examination Report, when the present application enters the national phase under Article 39(1) PCT, the subject matter of D3, in at least some Contracting States, may nevertheless be considered prior art. For example, under the European Patent Convention, the subject matter of D3 would be considered prior art within the meaning of Article 54(3) EPC, which merely prevents D3 from being used in the assessment of inventive step.

4.2 The Applicant is further reminded in this respect that the characterisation portion of independent claim 1 (- Rule 6.3(ii) PCT), in respect of the usefulness of the conversion of the motion vectors to "a more symmetrical form" (- so far as understood, i.e. through the rounding method of dependent claim 2) for dynamic false contour effect compensation, does not appear to be supported by the description.

Re Item VII

Certain defects in the international application

6.1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, i.e. it being noted that D1, in common with the subject matter of independent claim 1, discloses a method of processing video pictures (- Fig. 24), said method involving:

a display device (- "using the PDPs" - column 4, line 26) having a plurality of luminous elements;

video fields divided into a plurality of subfields (- Figs. 3a-6b and 9); and

using motion vectors (- "motion vector MV" - Fig. 25 and column 21, lines 12-15 and 41-46) to determine corrected subfield code words for dynamic false contour effect compensation (- "can reduce occurrence of moving image false edges" - column 4, lines 38-40),

and as such appears to disclose the closest prior art (- Article 33(2) PCT).

6.2 The description should be in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

Claims

1. Method for processing video pictures for display on a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields (SF) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, wherein with motion estimation motion vectors (MV) are calculated in pixel resolution for the pixels in a video picture, further comprising a step of performing correction of the video values or sub-field code words for the pixels along the direction of motion determined by the motion vector, **characterized in that**, the motion vector field is restricted to discrete motion vectors having the characteristic that the discrete motion vectors have a more symmetrical arrangement with regard to the pixels on which they lie than the excluded motion vectors, wherein if a calculated motion vector is not part of the restricted motion vector field, it is exchanged by a neighbouring motion vector of the restricted motion vector field, wherein the exchanged motion vector (MV) serves for calculating an optimised correction trajectory that determines at which pixel positions along the motion vector (MV) the correction values are placed for dynamic false contour compensation.

2. Method according to claim 1, wherein the following steps are used for determining the neighbouring motion vector in the restricted motion vector field for a calculated motion vector:

first, the smallest motion vector component S of

the calculated motion vector (MV) is selected where $S=\min(V_x, V_y)$ with V_x and V_y being the motion vector components of the calculated motion vector;

second, the ratio R between S and the other motion vector component V_i is calculated, where $R=V_i/S$ and $V_i=\max(V_x, V_y)$, with $i \in [x,y]$;

third, the ratio R is rounded and the other motion vector component V_i is updated according to the formula $V'_i = round(R) \cdot S$, where the determined neighbouring motion vector has the components S and V'_i.

3. Method according to claim 1 or 2, wherein for calculating the motion vectors in pixel resolution the motion vector components are rounded to integer values before the conversion, wherein in the rounding step the vector components are rounded down irrespective of their rational component value.

4. Method according to one of claims 1 to 3, wherein for calculating the correction values sub-field code word entry shifts are calculated for a pixel in dependence of the corresponding motion vector from the restricted motion vector field and wherein a rounding step is performed for each shift component during sub-field code word entry shift calculation, wherein in the rounding step the shift components are rounded down irrespective of their rational component value.

5. Method according to one of claims 1 to 3, wherein a correction for dynamic false contour effect compensation is made by calculating correction values on signal amplitude level and distributing the correction values among a number of pixels which are located along a

motion vector from the restricted motion vector field determined for a pixel of the picture.

6. Method according to claim 5, wherein the pixel positions $P_i = (\Delta'_x; \Delta'_y)$ which are used for correction value distribution are calculated with the formulae $\Delta'_x = i \times \frac{V_x}{N}$ and $\Delta'_y = i \times \frac{V_y}{N}$, where N is the number of pixels over which the correction value is to be distributed corresponding to the length of the motion vector $\vec{V} = (V_x; V_y)$, where i is an index running from 1 to N, wherein a specific rounding process is used for correction pixel location, wherein if the rational component value of a pixel coordinate Δ'_x, Δ'_y is in a first range, the pixel coordinate is rounded down, wherein if the rational component value of a pixel coordinate is in a second range above the first range, the pixel coordinate is rounded up and down thus leading to two different correction positions in parallel, and wherein if the rational component value of a pixel coordinate Δ'_x, Δ'_y is in a third range above the second range, the pixel component is rounded up.

7. Method according to one of claims 1 to 6, wherein it is used in a plasma display apparatus.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PD990068		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/09311	23/09/2000	27/09/1999
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON LICENSING S.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 12 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

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   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☒ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

CORRECTED VERSION

Date of submission of the demand	Date of completion of this report
19/04/2001	20.02.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Morris, D Telephone No. +49 89 2399 2182

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09311

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-20	as originally filed			

Claims, No.:

1-7	as received on	24/10/2001	with letter of	24/10/2001

Drawings, sheets:

1/7-7/7	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☒ the claims, Nos.: 1-7

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2, 6
	No:	Claims	1, 3-5, 7
Inventive step (IS)	Yes:	Claims	6
	No:	Claims	2
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item VIII

Certain observations on the international application

1.1 Reference is made to the following documents:

D1: EP-A-0 893 916 (MATSUSHITA) 27 January 1999 (1999-01-27)

D2: ZHU Y -W ET AL: '15.3: A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE FOR REDUCTING GRAY-SCALE DISTURBANCES ON PDPS' SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS,US,SANTA ANA, SID, vol. 28, 13 May 1997 (1997-05-13), pages 221-224, XP000722692 ISSN: 0097-966X cited in the application

D3: EP 0980059 A (DEUTSCHE THOMSON-BRANDT GMBH) 16 Febuary 2000 (16.02.2000)

1.1a The document D3, though cited by the Applicant self, was not cited in the international search report.

2. The following objections are made within the meaning of Article 6 PCT with respect clarity.

2.1 The feature of a "discrete motion vector" of present independent claim 1 is considered obscure as it is not clear from the wording of the claim alone (- PCT Guidelines III-4.2) in what respect said motion vector is restricted. It is noted in this respect that "vectors" per se are generally defined as comprising both direction and magnitude, whereupon it becomes obscure whether the restriction applied to the "discrete motion vector" of independent claim 1 is one involving options of:

- direction;
- magnitude; or
- both direction and magnitude.

Furthermore, it is noted from what is mentioned in the description (- see page 13, lines 20-21) that "discrete motion vectors" appear restricted merely in respect of "direction" only. However, from what is mentioned on lines 13-16 of present claim 1, i.e. of:

> "performing correction of video values [...] along the direction of motion determined for the pixels along the direction of motion determined by the motion vector"

it is implied by the wording of present claim 1 that a said "discrete motion vector" is only to be restricted in respect of its magnitude, whereupon there arises an inconsistency between the description and the claims (- Article 6 PCT; Guidelines III-4.3).

2.2 In a related aspect, the feature of a motion vector (so far as understood) having "a more symmetrical arrangement" of present independent claim 1 (- line 19) is also considered obscure as, assuming that e.g. vertical and horizontal components of a vector may be considered to have a symmetry of sorts, it is not clear in what respect one set of motion vectors may be considered to have a more symmetrical, or asymmetrical, arrangement than any other set of motion vectors. As such therefore the term objected to appears to comprise a form of wording considered to be vague or equivocal, and which leaves the reader in doubt as to the exact scope of the feature (- PCT Guidelines III-4.5).

2.2a In addition, when taking into account wording of the description of the present disclosure (- see e.g. "the compensation [...] respects more the symmetry of the human visual system" - page 16, lines 28-29 of the present application), it also becomes obscure as to whether or not the term "symmetry" per se has a special meaning in the sense of PCT Guidelines III-4.2), i.e. said special meaning involving "symmetry of the human visual system" rather than e.g. the vertical and horizontal components of a vector.

2.3 The feature of the "optimised correction trajectory" of independent claim 1 is considered obscure as the functional relationship between said "trajectory" and the respective features of (- cf. e.g. "Subfield No" tables on pages 15-17):

- the "discrete motion vector" (so far as understood); and
- the "sub-field code words",

is not clearly defined within the claim.

Furthermore said functional relationship, in respect of determining pixel positions to which correction values within video data for pixels are to be placed, also appears essential to the performance of the invention. As such therefore, failure to explicitly define said feature, is considered to cause an inconsistency between claim 1 and description (- Article 6 PCT; Guidelines III-4.3).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3.1 D2 discloses a method for processing video pictures (- "A MOTION-DEPENDENT EQUALIZING-PULSE TECHNIQUE" - TITLE) for display on a display device (- Plasma Display Panel - Page 221, left column, second paragraph, line 1) having a plurality of luminous elements corresponding to the pixels of a picture, wherein

- the time duration of a video frame or video field is divided into a plurality of sub-fields (- Modified Binary Code Scheme - Fig. 1b) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, and wherein
- motion vectors are calculated for pixels (- "Vector of Motion" - Fig. 5, comprising vertical component GHI and horizontal component IQRSTUVW), said motion vectors being used to determine corrected sub-field code words (- apply equalizing pulses - Table I and II and Fig. 4) for dynamic false contour effect compensation (- to compensate for "loss of temporal uniformity" due to change from 127th grey level to 128th grey level - page 222, left column, last three lines of the first paragraph).

3.1a Furthermore, insofar as D2 discloses applying motion correction in one of either:

- a vertical direction; or
- a horizontal direction

i.e. of the components GHI and IQRSTUVW of the "vector of motion" (- Fig. 5), the lesser of the two, is used in determining the corrected value (- page 223, left column, middle paragraph), D2 is also considered to disclose:

- "the motion vector field is restricted to discrete motion vectors [which] have a more symmetrical arrangement",

(- i.e. the vertical and horizontal directions equally dividing up the vector space).

3.1b In addition, insofar as the direction and magnitude of the discrete motion vector selected according to the teaching of D2 is optimised to include all pixels GHI and

QRSTUVW representing componenct vectors of the "vector of motion" in the "boundary of 127/128" (- Fig. 5 of D2), D2 is also considered to disclose:

"the exchanged motion vector serves for calculating an optimised correction trajectory that determined at which pixel positions along the [discrete] motion vector the correction values are placed for dynamic false contour compensation"

Accordingly, so far as understood, the subject matter of present independent claim 1 is not considered novel over D2 within the meaning of Article 33(2) PCT.

3.2 Further, insofar as D2 also discloses using said method in a plasma display panel (- Plasma Display Panel - Page 221, left column, second paragraph, line 1), the subject matter of independent claim 7 is also considered to lack novelty within the meaning of Article 33(2) PCT.

3.3 Further, insofar as D2 discloses (- cf. dependent claim 5):

- the correction values are distributed among a number of pixels (- Pixel positions J, K - Fig. 4) which are located among a motion vector determined for a pixel of the picture,

the subject matter of dependent claim 5, so far as understood, is also not considered novel over D2 within the meaning of Article 33(2) PCT.

3.4 Furthermore, insofar as mentioned in D2 that the display of any digital signal on a display apparatus comprising discrete pixel elements involves a rounding down process (- cf. dependent claims 2-4), i.e. see

"When an image is moving at 3.5 [P/F], for instance, the speed of the image on the screen repeats v=3 and 4 [P/F]" (- page 223, right column, second last paragraph, lines 3-6),

and insofar as that it is implicit that this rounding process would apply equally to both vector components of a motion vector, i.e. whether said components comprise either the vertical or horizontal component of the motion vector, the subject matter of dependent claims 3-4 are also not considered novel over D2 within the meaning of Article 33(2) PCT

3.5 It is acknowledged that D2 fails to disclose the steps of converting that component of the motion vector which is of largest value, as mentioned in dependent claim 2.

However, insofar as D2 discloses only ever using that component of the motion vector which has the smallest value (- "choose the direction with the lesser number" - page 223, left column, middle paragraph, line 6), said step of rounding down is not considered to provide any effect over that, which would have been expected by the person skilled in the art, were said step not to have taken place.

Accordingly, so far as understood, the respective subject matters of dependent claim 2 is not considered to involve an inventive step over D2 within the meaning of Article 33(3) PCT.

3.6 The subject matter of claim 6 is distinguished from D2 in that D2 fails to disclose or suggest the steps therein of calculating pixel positions which are used for correction value distribution.

3.6a In addition, none of the other available prior art documents, either alone or in combination, suggest or imply subject matter claimed in respect of dependent claim 6.

Accordingly, the subject matter of dependent claim 6 is considered to comprise new and inventive subject matter. Furthermore, dependent claim 6 is considered to meet the requirements of Articles 33(2)(3) PCT

Re Item VI

Certain documents cited (Rule 70.10 PCT)

4.1 D3 was published after the priority date of the present application, but the priority date of D3, i.e. 07 August 1998, is eleven months earlier than that of the present application (- see also Rules 64.3 and 70.10 PCT). Furthermore it is noted that insofar as e.g. D3 discloses a method for processing video pictures for a display device having a plurality of luminous elements, said method involving (- cf. preamble of claim 1 and features of dependent claim 6):

sub-fields (- Fig. 5);

pixel positions (- [SPEC0808]x_n, [SPEC0808]y_n - table of Page 5, paragraph 28); and

motion vectors (- "motion vector V = (Vx, Vy)" - page 5, line 26)

both the present application and the disclosure of D3 appear to be directed to substantially the same subject matter.

The Applicant is therefore subsequently reminded that though D3 cannot be considered as prior art within the meaning of Articles 33(2)(3) PCT for the purposes of an International Preliminary Examination Report, when the present application enters the national phase under Article 39(1) PCT, the subject matter of D3, in at least some Contracting States, may nevertheless be considered prior art. For example, under the European Patent Convention, the subject matter of D3 would be considered prior art within the meaning of Article 54(3) EPC, which merely prevents D3 from being used in the assessment of inventive step.

4.2 The Applicant is further reminded in this respect that the characterisation portion of independent claim 1 (- Rule 6.3(ii) PCT), in respect of the usefulness of the conversion of the motion vectors to "a more symmetrical form" (- so far as understood, i.e. through the rounding method of dependent claim 2) for dynamic false contour effect compensation, does not appear to be supported by the description.

Re Item VII

Certain defects in the international application

6.1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, i.e. it being noted that D1, in common with the subject matter of independent claim 1, discloses a method of processing video pictures (- Fig. 24), said method involving:

a display device (- "using the PDPs" - column 4, line 26) having a plurality of luminous elements;

video fields divided into a plurality of subfields (- Figs. 3a-6b and 9); and

using motion vectors (- "motion vector MV" - Fig. 25 and column 21, lines 12-15 and 41-46) to determine corrected subfield code words for dynamic false contour effect compensation (- "can reduce occurrence of moving image false edges" - column 4, lines 38-40),

and as such appears to disclose the closest prior art (- Article 33(2) PCT).

6.2 The description should be in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

Claims

1. Method for processing video pictures for display on a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields (SF) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, wherein motion vectors (MV) are calculated for pixels, **characterized in that**, the motion vectors (MV) are converted to a more symmetrical form and wherein the motion vectors (MV) in the symmetrical form are used to determine corrected sub-field code words for dynamic false contour effect compensation.

2. Method according to claim 1, wherein the following steps are used for motion vector conversion:

first, the smallest motion vector component S is selected where $S=\min(V_x,V_y)$ with V_x and V_y being the motion vector components;

second, the ratio R between S and the other motion vector component V_i is calculated, where $R=V_i/S$ and $V_i=\max(V_x,V_y)$, with $i \in [x,y]$;

third, the ratio R is rounded and the other motion vector component V_i is updated according to the formula $V'_i = round(R) \cdot S$.

3. Method according to claim 1 or 2, wherein the motion vector components are rounded to integer values before the conversion in the symmetrical form, wherein in the rounding step the vector components are rounded down irrespective of their rational component value.

4. Method according to one of claims 1 to 3, wherein sub-field code word entry shifts are calculated for pixels in dependence of the corresponding motion vectors and wherein a rounding step is performed for each shift component during sub-field code word entry shift calculation, wherein in the rounding step the shift components are rounded down irrespective of their rational component value.

5. Method according to one of claims 1 to 3, wherein a correction for dynamic false contour effect compensation is made by calculating correction values on signal amplitude level and distributing the correction values among a number of pixels which are located along a motion vector (MV) determined for a pixel of the picture.

6. Method according to claim 5, wherein the pixel positions $P_i = \left(\Delta_x^i; \Delta_y^i\right)$ which are used for correction value distribution are calculated with the formulae $\Delta_x^i = i \times \frac{V_x}{N}$ and $\Delta_y^i = i \times \frac{V_y}{N}$, where N is the number of pixels over which the correction value is to be distributed corresponding to the length of the motion vector $\vec{V} = \left(V_x; V_y\right)$, where i is an index running from 1 to N, wherein a specific rounding process is used for correction pixel location, wherein if the rational component value of a pixel coordinate Δ_x^i, Δ_y^i is in a first range, the pixel coordinate is rounded down, wherein if the rational component value of a pixel coordinate is in a second range, the pixel coordinate is rounded up and down thus leading to two different correction positions in parallel, and wherein if the rational component value of a pixel coordinate Δ_x^i,

Δ_y^i is in a third range, the pixel component is rounded up.

7. Use of the method according to one of the claims 1 to 6 in a plasma display device for dynamic false contour compensation.